



International Licensing Revisited: The Role of Copyright and Trademark Enforcement Strength

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Abstract

This study explores the instrumental role that copyright and trademark enforcement strength plays in stimulating licensing flows in 21 countries. In so doing, we use a panel data methodology to investigate the relationship between trademark and copyright enforcement strength levels of 21 countries and the choice between unaffiliated and affiliated licensing of US firms. The evidence suggests that both copyright and trademark enforcement strength have a highly significant effect on licensing and, more specifically, that stronger levels of enforcement stimulate higher levels of unaffiliated licensing.

Key Words: Intellectual Property, Copyright enforcement, Trademark enforcement

1. Introduction

This study investigates the role of copyright and trademark enforcement strength on stimulating licensing flows in 21 countries, by examining the tendency and preference of US firms to serve foreign markets by licensing their assets out to external non-affiliated companies or by operating with a hierarchical mode in order to protect their assets internally. The effect of intellectual property (IP) protection on the internationalisation of US firms has received much attention in the international business literature (Nicholson, 2007; Nunnenkamp and Spatz, 2004). This is because IP assets such as copyright and trademarks now play a central role in the formation of business models and competitive advantage of US firms (Idris, 2003). Indeed, the significance of trademark and copyright assets in building and supporting the brands of US firms is evidenced by the exponential growth in the value of the brands of top performing US firms across all industries over the last twenty years. For example, in 2014 the value of two US brands (Apple and Google) exceeded for the first time the \$100 billion threshold (Interbrand, 2014). In total, the value of IP held by US firms represents approximately 45% of the total US GDP (Shapiro and Hassett, 2005). In addition, the total value of UK IP exports exceeded £110 billion in 2009 (IP Office, 2011), while IPR intensive industries of the European Union (EU) generate almost 90% of all EU external trade and support directly or indirectly 35% of EU jobs (EPO & OHIM, 2013).

A key challenge that firms face when internationalising abroad is to gain protection for their IP assets and successfully enforce their IP rights in foreign countries. In order to maintain the competitive advantage gained from their investment in intangible assets, firms need to be able to appropriate the returns on their investments on IP assets such as copyright and trademarks in an effective manner. However, the IP assets of firms are often the victim of IP infringement. Infringement can take place in the form of piracy which relates to the unauthorized use or reproduction of copyrighted material and counterfeiting which relates to

the imitation of a product protected by patents or trademark (or both) without the owner's consent (Urbas, 2000). Even though many countries have directed significant resources and scaled up their efforts to tackle counterfeiting and piracy, the infringement of IP assets is a growing problem (USTR, 2014). For example, the global value of counterfeit and pirated products is estimated to have grown almost threefold in a seven-year period between 2008 and 2015 (BASCAP, 2011). IP asset owners experience significant losses from the sale of IP infringing assets. For example, it is estimated that the clothing footwear and accessories industries of the EU experience €26.3 billion of revenue losses annually due to counterfeiting (OHIM, 2015a), while the cosmetics and personal care industries of the EU experience losses of €4.7 billion (OHIM, 2015b), and the EU sports goods industry €500 million in losses (OHIM, 2015c).

While gaining protection and enforcing their IP rights may be a familiar process for firms at home, this becomes a significant challenge when operating abroad. The enforcement of IP rights requires an IP system where, for example, the judicial system upholds the rights of IP owners and police and customs authorities carry out successful enforcement operations (Papageorgiadis *et al*, 2014). This requires a substantial commitment of resources (monetary and human) by firms to proactively and reactively engage with IP enforcement authorities in order to help enforce their rights in practice. However, the levels of IP enforcement strength vary dramatically between countries, especially regarding the quality of enforcement of laws on IP infringement (OECD, 2008; Papageorgiadis *et al*, 2014). For example, criminal sanctions may not be regularly imposed, fines may be preferred to more severe penalties (the potential of imprisonment) and when fines are preferred the maximum or at least a high penalty might not be imposed, reducing the deterrence effect of such actions (Commission of the European Communities, 2009). It seems reasonable to suggest that IP infringement

would be a significantly smaller problem for firms if effective IP enforcement occurred worldwide.

This study makes a novel contribution to understanding this problem by empirically studying the effect of national copyright and trademark enforcement strength on US licensing flows internationally. Previous research by Park and Lippoldt, (2008) focused on the effect of copyright and trademark legislative strength on US licensing flows while other researchers have focused on the effect of patent legislative and actual enforcement strength on licensing (Papageorgiadis *et al.*, 2013; Yang and Maskus, 2001). However, previous research has been restricted from studying the effect of copyright and trademark enforcement strength due to the limited availability of secondary data to enable a panel econometric analysis. We use the two longitudinal indices of copyright and trademark enforcement strength developed by Papageorgiadis (2010), which capture the effectiveness and efficiency with which copyrights and trademarks are enforced in 21 countries and apply these in the context of US firms. We find that both copyright and trademark enforcement strength have a highly significant effect on licensing and, particularly, we find that stronger levels of enforcement stimulate higher levels of unaffiliated licensing. This suggests that in countries where the enforcement of copyright and trademark is strong, US firms experience significantly lower levels of transaction costs in enforcing their rights in practice and therefore find it optimal to trust the collaboration with non-affiliated parties by licensing out their IP assets.

In the next section we discuss the theoretical considerations that underpin our study while section three presents the data and model specification. Section four discusses the results and section five provides some concluding remarks.

2. Theoretical considerations

Licensing can be defined as a bilateral contractual agreement between two parties that enables an individual entity or firm (the licensee) to use the physical or intangible assets of the other party (the licensor) for a certain period of time and for a monetary or other return (Posner, 2005). Licensing can be categorised into affiliated and unaffiliated licensing. Affiliated (i.e. internal) licensing involves a contractual relationship between related companies, where an affiliated subsidiary is allowed to use the assets of the parent firm, in return for compensation, typically in the form of royalty and fee payments. Affiliate licensing occurs when a foreign company invests in a market, thereby creating a new company which belongs to the parent firm. Unaffiliated licensing is an alternative to the Foreign Direct Investment (FDI) entry mode where a contractual relationship takes place between unrelated firms. In such a relationship the asset owner licenses the exploitation of proprietary assets to external companies (Anderson and Gatignon, 1986; Contractor, 1981; 1984).

The internationalization of firms depends on the attributes of factors evident in the internal and external environment. The choice to enter an international market depends on the company's own firm-specific advantages (FSAs) as well as country-specific advantages (CSAs) – see Rugman and Verbeke (2001). FSAs relate to the unique (and difficult to replicate) capabilities of a company which provide it with a competitive advantage when active in the market. Such advantages can be IP assets in the form of technology, trademarks, marketing expertise and distribution skills. This notion is in line with the resource-based view of the firm which proposes that companies derive their competitive advantage primarily from the above average returns generated by valuable, heterogeneous and not perfectly mobile resources which they have at their disposal (Barney, 2001; Miller and Shamsie, 1996; Wernerfelt, 1984), of which knowledge-based or intellectual assets such as IP are important examples.

Such resources can also have an effect on the choice between licensing and FDI, since a company whose valuable intellectual assets in the form of copyrights and trademarks cannot be licensed effectively and securely (in terms of IP protection and enforcement) to an external party is likely to prefer to exploit those IP assets within its own hierarchical structures in order to mitigate the potential risk of leakage and imitation (Peteraf, 1993). This choice follows a transaction costs rationale which is predicated upon the assumption that organisations can successfully improve efficiency by reducing their exposure to transaction-specific costs (Williamson, 1993).

In order to understand the costs that occur in the transaction process, it is useful to first define what a transaction is. A transaction is the action that accrues from the transfer of a tangible or intangible asset (such as copyrights and trademarks) between a “technologically separable interface” (Williamson 1981, p. 552). Such assets can take the form of both goods and services (Williamson, 1993). Inefficient co-operation between economic actors (private or public organisations) involved in a transaction engender costs to the organisation. A transaction cost is the cost incurred in making an economic exchange or, in other words, the cost of participating in a market. Transaction costs are embedded in the perils associated with the *de facto* notion of incomplete contracting (Williamson, 1996). Contracting costs appear both prior to and after a contract is signed and their level of importance depends on the predicted guarantees embodied in the contract and the associated calculated risk (limited by incompleteness of the contract) (Williamson, 1993). The identification and measurement of transaction costs can help to explain the proposition that a firm’s mode of internationalisation to a foreign market is primarily determined by the level of control it can govern (Hennart, 2000; Zhao *et al.*, 2004). In the event of market failure, where the transactions costs of dealing in an external market are higher than internal organisation costs, this external inefficiency can be overcome using the internal organisation of an MNE (Hennart, 2000;

Buckley and Casson, 1976) through hierarchical, equity-intensive modes (i.e. FDI) rather than arm's length contracting (i.e. non-affiliate licensing). This notion is at the heart of Buckley and Casson's (1976) internalisation theory of the MNE (but see also Hennart 1986, 1989, 2000), and forms a component of Dunning's (1988) Eclectic Paradigm.

Country-specific advantages differ to FSAs in that they relate to unique and favourable features offered by a country to foreign firms. Such advantages include, *inter alia*, large market size, attractive production conditions, low political risk, relevant and low cost natural resources endowments and competitively priced labour (Rugman and Verbeke, 2001). One of the CSAs commonly considered by such studies is the level of intellectual property enforcement offered by the country (Papageorgiadis *et al.*, 2014). IP-owning companies that internationalise can profit from their valuable proprietary intellectual property such as copyright and trademarks, by licensing to affiliates or unaffiliated concerns in foreign markets. In countries that offer strong levels of copyright and trademark enforcement, firms are able to license their IP assets out to unaffiliated companies. This is because strong copyright and trademark enforcement levels provide reassurance to the owners of IP that should their licensees or other parties infringe their rights, the IP owner will be able to mobilize the local enforcement (and related) agencies to effectively and efficiently enforce their rights in practice.

There has been little research concerning the effect of IP protection and enforcement and this has been mainly done from the patent protection and enforcement perspective. Firms are found to license their IP to unaffiliated companies in countries offering strong patent protection levels in terms of book law rather than the actual enforcement of patent related legislation (Smith, 2001; Yang and Maskus, 2001; Nicholson, 2007). This has generally been found to be the case for the period covering the mid-80s to the mid-90s. In contrast, empirical analysis for later years found stronger patent protection to induce more affiliate than

unaffiliated licensing (Papageorgiadis *et al.*, 2013; Puttitanun, 2006), especially for developing countries (Park and Lippoldt, 2004). In addition, Papageorgiadis *et al.* (2013), conclude that firms are more likely to license to unaffiliated than affiliate parties, when patent enforcement is strong within a country.

In terms of copyright protection and enforcement, Park and Lippoldt (2004) found that book law copyright and trademark protection have no significant effect on affiliate or unaffiliated licensing activity. But it is important to note that, there has been no study carried out so far on the effect of copyright and trademark *enforcement* on affiliate and unaffiliated licensing activity. This is therefore the focus of this paper. To explore this relationship we specifically test the following hypothesis:

H: High levels of copyright and trademark enforcement strength positively affect the tendency and preference of U.S. companies to license out to unaffiliated than affiliated firms.

3. Data and Model Specification

We use panel data analysis to develop a model in order to explain the relationship between affiliated licensing transactions by US firms and the effects of trademark and copyright enforcement across 21 countries covering the period 1998-2011. The US licensing transactions data enable us to distinctively identify the preference of US firms to license assets that are related to IP internally to affiliated companies (via FDI and joint ventures) or to unaffiliated external companies.

The data employed covers 21 countries: Argentina, China, Chile, India, Indonesia, Malaysia, Mexico, Philippines Thailand, Australia, France, Germany, Hong-Kong, Israel,

Japan, Netherlands, New Zealand, Singapore, Spain, Switzerland and the United Kingdom (Table 1 provides the descriptive statistics of the variables used in the estimation).

-----Table 1 around here-----

3.1 Dependent Variable

We use the *U.S. Direct Investment Abroad: Royalties and License Fees and Other Private Services* data by the *US Bureau of Economic Analysis* (BEA). We follow the Papageorgiadis *et al.* (2013) approach for the construction of the dependent variable in our model, which is calculated as the ratio of affiliated licensing receipts to total licensing receipts for each country. This approach purports to gauge the proclivity of US firms to engage in transactions with affiliated rather than unaffiliated foreign entities when licensing abroad. The novelty of this approach is that the use of a single data type affords a distinction to be made between external and internal licensing transactions.¹

3.2 Independent and Control Variables

3.2.1 Trademark and copyright enforcement strength

The main independent variables used to proxy the effects of trademark and copyright enforcement in this study originate from the work of Papageorgiadis (2010) in which a conceptual framework is adopted in line with institutional and transaction cost theories which effectively constructs two indices measuring copyright and trademark enforcement over the period 1998-2007. In particular, each of the indices comprises four constructs – namely

¹ We recognise the possible limitation associated with the data used to construct the dependent variable in that there may be an amount of licensing (affiliated and unaffiliated) which goes unreported. Given that this dataset was used by previous studies in the literature (enabling the comparison of the results of this study, with those of previous studies in the literature) and that the availability of licensing data is scarce (making the BEA dataset almost unique) we assume that any potential unreported fees due to transfer pricing practices have a marginal effect on the reliability of the dependent variable.

search costs, servicing costs, property rights protection costs and monitoring costs that are quantified using secondary data. The index builds on and extends the work of Reynolds (2004) that measures the legislative aspects of copyright and trademark protection. The resulting novel index by Papageorgiadis (2010) captures the enforcement-related transactions costs that firms face when engaging with copyright and patent systems in foreign countries. As explained by Papageorgiadis (2010) such costs can emerge from the interaction with national intellectual property enforcement agencies (e.g. trading standards officers) that are responsible for ensuring the effective enforcement of IP owners' rights. With regards to the effect of the two indices on US licensing transactions, we expect a negative relationship between weak levels of copyright and trademark enforcement and the ratio of affiliated licensing total licensing receipts (the dependent variable). The weaker the copyright and trademark enforcement in a country, the more likely that US firms will internalise transactions to protect their IP through the use of affiliated licensing.

3.2.2 Other control variables

Our selection of control variables is premised on existing variables widely incorporated in previous studies in the literature. The two key control variables used are GDP per capita and population size. These account for the effect of market size as a factor attracting foreign investments (see Henisz, 2000; Park and Lippoldt, 2004; Yang and Maskus, 2001; Nicholson, 2007; Seyoum, 2006). Previous empirical studies suggest that larger markets have a positive impact on FDI levels, with smaller markets being more likely to be served via unaffiliated companies (Chakrabarti, 2001; Nunnenkamp and Spatz, 2002; Pfister and Deffains, 2005).

Two additional proxies also feature in the econometric model seeking to capture the extent to which countries are open to FDI - through minimizing tariff and non-tariff barriers - as well as offer investment freedom to improve the investment climate and attract foreign

investments (Bengoa and Sanchez-Robles, 2003; Contractor, 1985, 1990; Quazi, 2007). We use a) the Investment Freedom Index published in the Index of Economic Freedom report of the Heritage Foundation (various years) and b) the ratio of FDI stock to GDP to account for the FDI openness of a country. In this context, higher levels of openness to FDI flows and economic freedom are expected to attract higher levels of affiliated investments. In contrast, US firms are expected to serve a market via unaffiliated parties when investment freedom and openness to FDI is low (Bengoa and Sanchez-Robles, 2003; Contractor, 1985, 1990; Quazi, 2007).

Furthermore, we also incorporate a proxy for the effect of exchange rate volatility on affiliated and unaffiliated licensing transactions (Maskus, 2000). In countries where exchange rate volatility is high, US firms are expected to license their IP rights internally to affiliated parties in order to mitigate the risk by advancing or delaying the timing of payments back to the US parent firm when the exchange rate becomes favourable (Papageorgiadis, *et al*, 2013). We therefore anticipate a positive relationship between high levels of exchange rate volatility and affiliated licensing.

In addition, following the previous literature (Buckley et al., 2007) we control for the effect of political risk in a foreign market using the political risk variable of the International Country Risk Guide (ICRG) published by the PRS group (PRS Group, 2015). Higher values in the political risk index indicate countries that experience relative political stability, whereas lower values indicate politically unstable countries. Therefore, we expect a positive relationship between political stability and affiliated licensing transactions which enable foreign firms to fully appropriate the returns of their IP in the country, and use unaffiliated parties to serve the market when political risk is high in order not to commit to overseas investments (Contractor, 1985, 1990; Pfister and Deffains, 2005).

We also use data on the geographic distance between the US and the 21 countries, by calculating the kilometric distance between Washington DC and the capital city of each country in question (Stein and Daude, 2007). We expect a positive relationship between greater levels of geographic distance between the home and host country and the dependent variable, with US firms preferring to internalise transactions using affiliated companies in order to overcome communication, managerial and monitoring costs (Maskus, 2000).

In addition to geographic distance, we also control for the potential effect of countries being members of the Eurozone, namely France, Germany, Spain and the Netherlands (Clegg and Cross, 2000). In so doing, we construct a binary variable and allocate the value of “1” to the four countries in our sample which are members of the Eurozone and “0” when not. We anticipate a positive relationship between membership of the euro and the dependent variable, since US firms are more likely to internalise transactions by licensing to affiliate companies in order to achieve economies of scale via gaining access to multiple investment locations within the economically integrated region (Clegg and Cross, 2000).

Finally, we calculate the cultural distance between the US and each country in our dataset using the scores developed by Hofstede (2001) and following the methodology of Kogut and Singh (1988). We anticipate higher levels of cultural distance to have a positive relationship with affiliated licensing, since it will be optimal and more efficient for US firms to serve the market via internal organisation, rather than have to manage such cultural differences with external parties.

3.2.3 Model Specification

For the empirical investigation we have adopted a panel data analysis (Baltagi, 2001). In estimating the model a data-set was used which comprises N cross-sectional units, denoted $i = 1, \dots, N$, observed at each of T time periods, denoted $t = 1, \dots, T$. We have a total of TN

observations and y is a $(TN \times 1)$ vector of endogenous variables and X is a $(TN \times k)$ matrix of exogenous variables, which does not include a column of units for the constant term. The generalized regression model for our basic framework is as follows:

$$y_{it} = \alpha_i + \beta_i' x_{it} + \varepsilon_{it} \quad (1)$$

$$\varepsilon_{it} \sim \text{i.i.d.} (0, \sigma_i^2)$$

where α_i is a scalar and β_i is a $(k \times 1)$ vector of slope coefficients. The underlying assumptions are similar variances between countries (i.e. $\sigma_i^2 = \sigma^2 \forall i$) and zero covariances (i.e. $\text{Cov}(\varepsilon_{it}, \varepsilon_{js}) = 0$ for $i \neq j$).

Equation 2 below expresses the ratio of licensing receipts from affiliated to total licensing receipts as a function of a string of independent variables.

$$LR_{it} = \alpha_0 + \alpha_1 X_{it} + D_{it} + \varepsilon_{it} \quad (2)$$

$$\varepsilon_{it} = v_i + u_{it}$$

where LR_{it} is the ratio of total licensing receipts by affiliated to total licensing receipts, X_{it} consists of a number of variables that test the hypothesis stated above, D_{it} is a dummy variable, ε_i is the disturbance term, v_i captures the unobserved country-specific effect while u_{it} is the idiosyncratic error. This is a one-way error component regression model, where $v_i \sim \text{IIN}(0, \sigma^2)$ and independent of $u_{it} \sim \text{IIN}(0, \sigma^2)$. In passing it should be mentioned that, apart from the dummy variable, the natural logarithm of each variable is used.²

² The heteroskedastic nature of time series as well as the interpretation of the coefficients of transformed variables as elasticities is two valid reasons why logarithmic transformations in econometrics are used.

4. Interpretation of Results and Discussion

Various regression specifications were explored and subjected to a series of testing to ensure validity and robustness. More specifically, the White heteroskedasticity consistent covariance estimator with ordinary least squares estimation was used to ensure that the standard errors are robust. The Durbin–Wu–Hausman test for endogeneity was employed in an attempt to identify and effectively address potential limitations in the model. Additionally, the variance inflation factor (VIF) as well as the cross correlations (see Table 2) of the variables suggested that existing collinear relationships were kept to their minimum as the average VIF score was below 2 when a common rule of thumb is that VIF scores higher than 10 may constitute a legitimate reason for concern.

-----Table 2 around here-----

We estimate three different models, namely the pooled, fixed effects and random effects models. On the basis of the selection criteria, i.e. F-test, Hausman and LM tests, the fixed effects model is preferred. The estimated lagged specifications returned insignificant coefficients and were therefore dropped from the final estimation process. The results are reported on Table 3 below.

-----Table 3 around here-----

The results show a strong relationship between the ratio of US affiliated to total licensing and the majority of the independent variables. The coefficient of determination (R^2) in both estimated models suggests that a relatively high percentage of the variation in the dependent variable for both models is adequately explained by variations in the independent variables. The coefficients of trademark enforcement (model 1) and copyright enforcement (model 2) strength indices are significant at the 1% level bearing the expected negative signs

across both specifications. This indicates that an increase in the trademark and copyright enforcement strength levels of a country will stifle affiliated licensing. The results confirm our hypothesis that higher levels of copyright and trademark enforcement strength positively affect the tendency and preference of U.S. companies to license out to unaffiliated than affiliated firms. The findings also provide support to the propositions of internalisation theory (Nicholson, 2007; Park and Lippoldt, 2001; Yang and Maskus, 2001). Higher levels of copyright and trademark enforcement enable U.S. firms to confidently collaborate with unaffiliated companies by licensing their IP assets to them. This is because the U.S. company can safely anticipate that it will be able to effectively engage with the relevant IPR enforcement agencies in the host country and cease a copyright or trademark infringement case, by facing limited transaction costs (Hennart, 2000). In contrast, U.S. firms select to internally control and protect their copyright and trademark assets within affiliate subsidiaries when operating in countries that boast low levels of copyright and trademark enforcement strength. This is because the firms prefer to avoid licensing their assets to unaffiliated firms, fearing the market failure potential due to the external inefficiencies when attempting to monitor and enforce their copyright and trademarks in an external low enforcement market. This is the first empirical evidence that highlight the significant effect that copyright and trademark enforcement strength (as CSAs) have on the mode of internationalization of U.S. firms.

Looking at the coefficients of the control variables, we find the majority of the variables to perform according to the established theoretical and empirical expectations. Both market size proxies used (GDP per capita and population) are found to have a highly significant positive effect on the dependent variable. This suggests that the larger the market size of a country, the higher the tendency and preference of US firm to license to affiliated (rather than unaffiliated) firms and is in line with theoretical expectations (Contractor, 1985;

Pfister and Deffains, 2005). Furthermore, the political risk, FDI openness and exchange rate volatility variables are also found to be highly significant and positively related to the ratio of affiliated to total licensing receipts. Countries with low political risk that are more open to FDI but experience higher levels of exchange rate volatility are found to experience higher levels of affiliated than unaffiliated licensing.

In contrast, the investment freedom and Eurozone dummy variables are found to be highly significant but negatively related to the dependent variable. This suggests, therefore, that US firms operating in countries with fewer impediments to foreign investments as well as in the Eurozone are more likely to license their IP assets to unaffiliated parties rather than exploit them internally. Finally, the control variable capturing cultural distance has a highly significant, negative relationship with the dependent variable, suggesting that when cultural distance is high, firms would prefer to license their IP rights to external parties, in order to minimize the internal organisation transaction costs.

5. Conclusions

This paper explores the relationship between the trademark and copyright enforcement strength levels of 21 countries and the choice between unaffiliated and affiliated licensing of US firms using panel data analysis for the years 1998 to 2011. With the value of the IP assets of US firms rising over the last 20 years, the effectiveness and efficiency with which such firms are able to enforce their copyright and trademark rights in foreign countries affects the type of investment with which US firms will serve such markets. While the previous literature mainly focused on the effect of the strength of copyright and trademark regulations (not the enforcement) on licensing, this study uses two indices that measure copyright and trademark enforcement strength developed by Papageorgiadis (2010). We find stronger levels

of copyright and trademark enforcement to have a highly significant but negative effect on US licensing transaction abroad. This suggests that US firms are more likely to exhibit a greater tendency and preference for unaffiliated licensing when operating in markets where their copyright and trademark assets are more likely to be effectively and efficiently enforced. In contrast, in markets where the enforcement of IP rights is expected to generate high transaction costs and the outcome of the enforcement efforts is uncertain, US firms prefer to carry out a hierarchical mode of investment in a country, thereby protecting their IP rights internally. Since this study solely focuses on US licensing transactions abroad, future research should explore the effect of international copyright and trademark enforcement levels on the licensing transactions abroad from other countries.

The results reported in this paper have important implications for both the owners of IP assets and those countries that are recipients of IP licensing. In the context of strong copyright and trademark enforcement, we can anticipate that US firms will be willing to expand their global reach through unaffiliated licensing and have greater confidence in achieving an appropriate return on their assets. Global collaboration is supported through lower transaction costs as a consequence, with benefits for all parties concerned. In particular, the recipients of IP licences are likely to experience spill-over effects over time with positive implications related to their long term levels of economic growth. These effects will be particularly important in the context of developing and emerging markets where copyright and trademark enforcement is likely to be less rigorous than elsewhere. The implications are twofold: on the one hand, the results are important for US policy makers, since they provide them with a clearer picture of how US companies engaged in international licensing activities alter their structure as a reaction to the levels of copyright and trademark enforcement. On the other, trading partners with the U.S. who seek FDI or licensing agreements from U.S. companies may, *ceteris paribus*, vary their copyright and trademark enforcement practices

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3 accordingly. For example, the results suggest that as copyright and trademark enforcement
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5 increases the propensity for US firms to use non-affiliate licensing to affiliate (FDI) rises and
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7 this might be one justification for looking to improve copyright and trademark enforcement
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9 levels in a country.
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Table 1. Descriptive statistics

Variables	Mean	Std.Dev.	Min	Max
Trademark Enforcement	0.56	0.19	0.23	0.83
Copyright Enforcement	0.65	0.16	0.38	0.901
Geographic Distance	10423.5	4105.9	3038.5	16370.8
Exchange Rate Volatility	0.487	0.50207	0.0001	2
Cultural Distance	47.5	24.9	14	90
Population	158.8	338.6	3.788	1321.052
FDI Openness	46.09	65.05	0.63	577.1
GDP per Capita	17457.9	14063.9	405.6	58513.2
Investment Freedom	63.48	19.54	30	90
Political Risk	9.14	1.36	5.33	12
Ratio of Licensing Receipts by US Affiliates to Total Licencing Receipts	0.95	0.07	0.61	100

Table 2. Correlation matrix

	Geographic Distance	Cultural Distance	FDI Openness	GDP per Capita	Population	Exchange Rate Volatility	Investment Freedom	Political Risk	Ratio of Affiliate Licensing Receipts to Total	Copyright Enforcement	Trademark Enforcement
Geographic Distance	1										
Cultural Distance	0.33	1									
FDI Openness	0.18	-0.11	1								
GDP per Capita	-0.32	-0.25	0.23	1							
Population	0.09	0.03	-0.23	-0.41	1						
Exchange Rate Volatility	-0.48	-0.21	-0.03	0.06	-0.29	1					
Investment Freedom	-0.1	-0.15	0.34	0.36	-0.34	0.37	1				
Political Risk	0.19	-0.14	0.15	-0.04	0.12	0.04	0.03	1			
Ratio of Affiliate Licensing Receipts to Total	0.45	0.14	0.01	-0.56	0.14	-0.44	0.03	-0.01	1		
Copyright Enforcement	0.3	0.26	0.18	-0.08	-0.23	-0.21	-0.02	-0.04	-0.07	1	
Trademark Enforcement	0.24	0.33	0.14	0.25	-0.42	0.1	0.26	0.01	-0.14	0.56	1

Table 3. Regression estimation results of Fixed Effects specifications

Variables	Model 1	Model 2
Trademark Enforcement	-0.261(0.000)*	-
Copyright Enforcement	-	-0.077(0.000)*
Geographic Distance	-0.028(0.199)	-0.015(0.256)
Exchange rate volatility	0.084(0.000)*	0.022(0.000)*
Cultural Distance	-0.002(0.043)**	-0.001(0.047)
Population	0.017(0.000)*	0.018(0.000)*
FDI openness	0.010(0.000)*	0.026(0.000)*
GDP per capita	0.028(0.000)*	0.017(0.000)*
Investment Freedom	-0.004(0.001)*	-0.024(0.000)*
Political Risk	0.106(0.032)*	0.021(0.000)*
Eurozone Dummy	-0.005(0.001)*	-0.014(0.002)*
Constant term	0.612(0.000)*	0.752(0.000)*
<i>F-test (FE=0)⁽¹⁾</i>	3.76	2.73
<i>Wald Test⁽²⁾</i>	34.8	25.4
<i>Hausman⁽³⁾</i>	21.5	17.8
<i>R²</i>	0.72	0.75
Notes: ⁽¹⁾ Test that all coefficients (except intercept and fixed effects) are jointly not significant. ⁽²⁾ Tests the joint significance of the fixed effects estimates. ⁽³⁾ Selection test between the Fixed Effects and the Random effects models. (*), (**) denote significance at the 1% and %% level respectively; t-statistics are given in parenthesis.		